Economic Change and the Organization of Industry: is the Entrepreneur the missing Link?

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In the economic literature the entrepreneur is usually associated with innovation and change. Actually we can distinguish several kinds of entrepreneurs who are essentially gathered in two traditions. The first, the Austrian though describes the entrepreneur as the agent of novelty and change. The second, called the "Anglo Saxon tradition" (Witt, 1999, 2005), considers the firm as the central unit of analyses. As a consequence the entrepreneur is only a virtual agent who exists but who has no real functions in the work of the economic system. Although we can not imagine an entrepreneur without a firm, "economic theorizing has not taken much interest in the relation between entrepreneurship and the firm as an organizational form" (Witt, 1999, p. 99).

However, it's possible to distinguish a third way: the Marshallian, which uses a different approach of knowledge to connect innovation and economic development to the firm, through the role of the entrepreneur. As a result, the entrepreneur, organise the production but he is also the engine of the economic change. This framework is less used principally for two reasons. First, there is a systematic opposition of the neo-classical Marshall, which developed in the *Principles of Economics* the theory of demand and supply and the partial equilibrium, and the evolutionist and empirical one of *Industry and trade.* If the primary approach could be accepted, unless it remains a simplified view, the second is more harmful. Indeed, Marshall thus becomes at the origins of a tradition which concepts and analyses were done by others. In fact, his writings hold few metaphoric references to evolutionist principles. Secondly, economic literature goes rarely beyond the presentation of organization as a fourth factor of production or as a phenomenon that operates in three distinct levels: the firm, the industry, and the nation. That kind of interpretation masks the fact that for Marshall "organization aids knowledge" and "knowledge is our most powerful engine of production" (Marshall, 1920, p. 115). Moreover, these tree levels of organization are not conceptually different, it's just the reverse, there are all relative to the organization of the production which has two dimensions: one specific to the firm, "the internal" organization, one specific to the industry, "the external organization". If the former enables to explain the origin of increasing returns the latter let's foresee the future potential economies. The problem becomes how to articulate these two dimensions.

Marshall considers two solutions to overcome this difficulty. The first, the most famous, rests on the concept of representative firm and the distinction between internal and external economies. This attempt leads however to a dead end because Marshall does not manage "to link" his static approach of the value and his dynamic conception of the industrial development (Thomas, 1991, Quéré and Ravix, 1998). The second solution, fuzzier, appears in Marshall's analyses of the role of the "manufacturer" or of "the entrepreneur" (Loasby, 1986). Indeed, in his *Principles*, he insists on the fact, that the entrepreneur "who makes goods not to meet special orders but for the general market, must, in his first role as merchant and organizer of production, have a thorough knowledge of *things* in his own trade" (Marshall, 1920, p. 248). In this extended knowledge, Marshall includes the capacity of "forecasting the broad movements of production and consumption, of seeing where there is an opportunity for supplying a new commodity" and to improve "the plan of producing an old commodity" *(ibid.)*. In integrating the economic function of knowledge in the role of the entrepreneur, Marshall opens an original analytical perspective likely to explain the conceptual link between innovation and industrial organization. The interest of this new perspective is to show that innovation is not independent to the action of producing and that to analyse the first and its effects, it is necessary to be able to grasp the second, *i.e*. to theorize the economic function of the entrepreneur.

In this paper, we propose to show that the field of research opened by Marshall was partly explored by Frank H. Knight (1921) with his concept of organic entrepreneur. But the entrepreneur function was diluted by Ronald H. Coase (1937) to explain the nature of the firm. This result, which can be called "the paradox of the entrepreneur", appear too in a different way in the Austrian approach and more specifically in I. Kirzner's work. We will see in a third section that unlike the new institutional economy, Austrians tackle the question of the action of the entrepreneur. Lastly, in a fourth section, we will show how E. Penrose avoids this paradox and converges to the Marshallian approach in managing simultaneously to threat the firm as an institution and to give to the action of the entrepreneur a precise theoretical status.

FRANCK H. NIGHT AND THE ORGANIC ENTREPRENEUR

For Knight, "the uncertainty problem in economics is the forward-looking character of the economic process itself" (Knight, 1921, p. 237). That's what he explains thanks to the fact that « the production of goods requires time » (*ibid*.). More precisely, uncertainty has two origins: first, decisions have to be made before the launch of the production process and no one knows if it would be successful. Secondly, the demand is in reality future needs, what is also hard to predict. As a result : "the producer, then, must *estimate* (1) the future demand which he is striving to satisfy and (2) the future results of his operations in attempting to satisfy that demand" (*ibid.,* p. 238).

Knight is convinced that "under the enterprise system, a special social class, the business men, direct economic activity ; they are in the strict sense the producers, while the great mass of the population merely furnish them with productive services, placing their persons and their property at the disposal of this class" (*ibid*., p. 271). But the function of the entrepreneur is not limited to the organization and the direction of the production, "the entrepreneurs also guarantee to those who furnish productive services a fixed remuneration" (*ibid*.). This last role is a necessary condition to guarantee that the entrepreneur would be able to manage the production. In fact, "with human nature as we know it would be impracticable or very unusual for one man to guarantee to another a definite result of the latter's actions without being given power to direct his work. And on the other hand the second party would not place himself under the direction of the first without such a guaranty" (*ibid*., p. 270).

Anyway, the role of the entrepreneur cannot be defined only through the specificity of profits compared to any other kind of payment. It is more related to the question of the place of the entrepreneur in the mutation of the general conditions of the economic activity. Knight has this approach. Indeed, "Knight's philosophy is to recall the distinction he constantly makes between the mechanical and organic (biological) frameworks. Mechanistic thinking views human behaviour and institutions as static, machine-like entities, whereas organicistic thinking invokes notions such as change and process" (Langlois et Cosgel, 1993, p. 458).

This distinction, essential for Knight, enables to understand his thought on the role of knowledge and on "the relation between knowledge and behaviour" (*ibid*., p. 197). He insists specifically on the fact that "if all changes were to take place in accordance with invariable and universally known laws, they could be foreseen for an indefinite period in advance of their occurrence, and would not upset the perfect apportionment of product values among the contributing agencies, and profit (or loss) would not arise" (*ibid*., p. 198). Hence, for Knight, "it is our imperfect knowledge of the future, a consequence of change, not change as such, which is crucial for the understanding of our problem" (*ibid*.). The main idea is not that change occurs or could occur in the economic process but that we are unable to predict future events. However, if our ignorance about the future is radical, we would be in a similar situation than if all the events, past present and future are known. In both situations nobody can predict anything and there would be no entrepreneur and no profits. On the contrary, when some random events occur with "sufficient regularity to be practically predictable in large measure" (*ibid.*), the principle of anticipation becomes meaningful. Hence emerge "the justification and the necessity for separating (…) the effects of change from the effects of ignorance of the future" (*ibid.*). This conceptual distinction permits to understand why some agents dare make some anticipation although the future is unknown. Indeed, "even though the business man could not know in advance the results of individual ventures, he could operate and base his competitive offers upon accurate foreknowledge of the future if quantitative knowledge of the probability of every possible outcome can be had" (*ibid.*, pp. 198-199).

Be that as it may, while the entrepreneur manages uncertainty, he is not for Knight a speculator. Speculation is not specific to the entrepreneur's function and it is done by others as the assurance agent or the fund holder. On the other hand, the entrepreneur is the only one who assumes the risk induced by the production temporality. This activity is not limited to a technical coordination, in a mechanical world. Indeed, "with uncertainty entirely absent, every individual being in possession of perfect knowledge of the situation, there would be no occasion for anything of the nature of responsible management or control of productive activity" (*ibid.*, p. 267). In such a world, "the flow of materials and productive services through productive processes to consumer would be entirely automatic" (*ibid.*). The set up of such an automated system would be "the result of a long process of experimentation, worked out by trial-and-error methods alone" (ibid). This mechanical world does not exclude the presence of "managers, superintendents, etc., for the purpose of coordinating the activities of individuals" (*ibid.*, p. 267), but the last are "labourers merely, performing a purely routine function, without responsibility of any sort" (*ibid.*, p. 268).

The introduction of uncertainty completely changes the situation and "the primary problem or function is deciding what to do and how to do it" (*ibid.*). According to these conditions, production cannot be entrusted to anybody who coordinates the production factors only in a mechanically way. The function of the producers is increasingly complex, for two reasons. "In the first place, goods are produced for a market, on the basis of an entirely impersonal prediction of wants, not for the satisfaction of the wants of the producers themselves. The producer takes the responsibility of forecasting the consumers' wants. In the second place, the work of forecasting and at the same time a large part of the technological direction and control of production are still further concentrated upon a very narrow class of the producers" (*ibid.*). According to Knight, these reasons justify the existence of a new actor: the entrepreneur. This one is essential because "when uncertainty is present and the task of deciding what to do and how to do it takes the ascendancy over that of execution, the internal organization of the productive groups is no longer a matter of indifference or mechanical detail" (*ibid.*). As a consequence, the organization of the production could not be anymore done in a mechanical and routinized way, a total mutation of the producer function occurs. This metamorphosis is set up as a biological process since "centralization of this deciding and controlling function is imperative, a process of 'cephalisation', such as has taken place in the evolution of organic life, is inevitable, and for the same reasons as the case of biological evolution" (*ibid.*, pp. 268-269).

This process, leads to an "organic entrepreneur" (Quéré et Ravix, 1997), who have essentially, two ways to buffer uncertainty. On the one hand, "consolidation", which lays on the "law of large numbers" and, on the other hand, "specialization", which consists in the selection of the most capable in the management of uncertainty? Following Knight, "consolidation and specialization are intimately connected" (*ibid.*, p. 240) because they are related to a characteristic of the human nature: "Men differ in their capacity by perception and inference to *form correct judgments* as to the future course of events in the environment" (*ibid*., p. 241). However, as these capacities can be gained with experience, Knight admits that "knowledge is more a matter of learning than of the exercise of absolute judgment" (*ibid*., p. 243). But "learning requires time, and in time the situation dealt with, as well as the learner, undergoes change" (*ibid*.). As a result the entrepreneur originates in an endogenous and cumulative process. This process can be explained first because "the specialisation of uncertainty-bearing in the hands of entrepreneurs involves also a further consolidation"; and secondly it is "closely connected with changes in technological methods which (a) increase the time length of the production process and correspondingly increase the uncertainty involved, and (b) form producers into large groups working together in a single establishment or productive enterprise and hence necessitates concentration of control" (*ibid*., p. 245).

THE RISE OF THE FIRM AS AN INSTITUTION AND THE EVICTION OF THE ENTREPRENEUR

Coase generates the firm from the market. This approach constrains him to give up the prospect developed by Knight and to compare the entrepreneur to a simple coordinator; with no specific role. The aim of Coase is to show "that a definition of a firm may be obtained which is not only realistic in that it corresponds to what is meant by a firm in the real world, but is tractable by two of the most powerful instruments of economic analysis developed by Marshall, the idea of the margin and that of substitution, together giving the idea of substitution at the margin" (Coase, 1937, p. 386). "The Marshall" used by Coase is obviously the one of the Book V of the *Principles* who explains how the allocation of resources is carried out by the price system. It is thus not astonishing that Coase considers that "Marshall introduces organization as a fourth factor of production" (*ibid.*, p. 388)

By adopting this point of view, Coase partly changes the debate of his time from the role of the entrepreneur to the problem of compatibility between two alternative modes of allocation of resources: the firm and the market. He wishes “to bridge what appears to be a gap in economic theory between the assumption (made for some purposes) that resources are allocated by means of the price mechanism and the assumption (made for other purposes) that this allocation is dependent on the entrepreneur-co-ordinator” (*ibid.*, p. 389). The real aim of Coase is to explain “why a firm emerges at all in a specialized exchange economy” (*ibid.*, p. 390). As a consequence, he develops an analysis to compare the allocative efficiency of two institutions: the firm and the market. These ones are in competition as there have both the same functions but different mechanisms. Indeed, in the market the allocation is done through the price system whereas in the firm it is under the authority of the entrepreneur. We can underline that in this perspective the entrepreneur has the same function than the market.

The choice of the best modality of coordination is based on the assumption that the information is imperfect. In this respect the use of the price mechanism has a cost as the research of the relevant prices or negotiating. Nevertheless, in “forming an organization and allowing some authority (an entrepreneur) to direct resources, certain marketing costs are saved”. For Coase, the uncertainty is exclusively about the course of the transactions. This point of view is far from the analyses of F. Knight (1921), and if Coase recognizes that “it seems improbable that a firm would emerge without the existence of uncertainty”, he makes clear that “those, for instance, Professor Knight, ‘who make the mode of payment’ the distinguishing mark of the firm (…) appear to be introducing a point which is irrelevant to the problem we are considering” (*ibid.*, p. 392).

The problem is the size of the firm, or of its boundaries, *i. e.* the share of the function of coordination in between the firm and the market, which lays according to Coase on the “diminishing returns to management” (*ibid.*, p. 395). This static problem can be solved with the adoption of a sharing rule. For Coase, the organization of a transaction in house has also a cost. As a consequence, "firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm" (*ibid*., p. 395). The size of the firm is then function of the marginal cost of an operation. Beyond the equilibrium position, "the costs of organizing within the firm will be equal either to the costs of organizing in another firm or to the costs involved in leaving the transaction to be 'organized' by the price mechanism" (*ibid*., p. 404).

The firm appears from the market and is designed to allocate resources at a cost inferior or equal to the market one. This function seems to be specific enough for Coase to justify the role of the entrepreneur. Indeed, he claims that his analysis "clarified the relationship between initiative or enterprise and management" (*ibid*., p. 405), functions that are both, according to him, combined by the entrepreneur. However, "initiative means forecasting and operates through the price mechanism by the making of new contracts" and "management proper merely reacts to price changes, rearranging the factors of production under its control" *(ibid.)*. As a result the functions of the entrepreneur are in reality governed by the price system. He is not different from the others agents of the economic system and like them he behaves according to the signs of the market.

The eviction of the entrepreneur is clearer as Coase's analysis is carried out in the static framework of equilibrium. It is really hard to understand what can be the initiative function of the entrepreneur in such construction. This contradiction appears in *the nature of the firm* when he explains that; "business men will be constantly experimenting, controlling more or less, and in this way, equilibrium will be maintained. This gives the position of equilibrium for static analysis" (*ibid*. p. 404). As a consequence, there is not a specific implication of the entrepreneur in the functioning of the economy; and nothing makes it possible to specify his role.

Although, Coase evokes the idea that the "dynamic factors" has an important influence on the costs of organising an activity through the firm and the market, his analysis remains basically static for two reasons. Firstly, he does not clarify neither the nature of these dynamic factors nor their incidence; secondly he doesn't differentiate the action of coordination and that of allocation. On the other hand, if we retain the idea suggested by M. Casson that "coordination is a dynamic concept, as opposed to the allocation, which is a static one". The entrepreneur can appear since "the concept of coordination captures the fact that the entrepreneur is an agent of change: he is not concerned merely with the perpetuation of the existing allocation of resources, but with improving upon it" (Casson, 1982, p. 24). However, such a perspective implies to give up the traditional interpretation of the idea of coordination but also to leave the static framework of the Coasian analysis.

The problem of Coase is not the same that Knight proposed to solve twenty years ago. This is clear in the divergent points of view that these two authors have about uncertainty. Indeed, Coase retains a narrow view of uncertainty, taking the form of imperfect information on the whole states of the world. In spite of its static nature, it is sufficient to justify that the transactions organized within the firm or on the market are more or less expensive and to explain the emergence of the firm as an institution that coordinate as the market. For Knight, uncertainty has another dimension. It is basically related to the temporal character of the production and to the fact that the economic process itself changes. In his own way Knight extends the Marshallian vision and avoids the paradox of the entrepreneur met by Coase, but he does not really approach the problem of the institutional organization of the production.

MARKET PROCESS AND THE DILUTION OF THE ENTREPRENEUR'S ACTION

The Austrian perspective can be approached as a second junction because it does not fallow Coase (1937) but Hayek (1937). As a result, instead of being interested by the firm as an organization, they point out the role of knowledge in the action of the entrepreneur on the economic activity. "Entrepreneurship is about change. It is about how the organization of economic activity extends and reshapes itself. The theme of novelty and change is especially clear in Schumpeter, for whom entrepreneurship is the carrying out of new combinations, and in Kirzner, for whom entrepreneurship is the perception of new frameworks of means and ends" (Langlois, 2005, p. 3). Anyway, we can distinguish these two approaches. Schumpeter insists on the entrepreneur as an innovator, though Kirzner's emphases the role of arbitrage of the entrepreneur (1973). They both criticize the neo-classic theory of competition, but on different bases. If Schumpeter questions the logical solidity and the relevance of the theory of the perfect competition, Kirzner on the contrary seeks to provide a better comprehension of the forces leading to the determination of the equilibrium.

Nevertheless, it is possible to admit that "in the competitive market process, the Schumpeterian and Kirznerian entrepreneurs may complement each other – the one creating change, the other responding to it" (McNulty, 1987, p. 537). Kirzner has the same point of view and points out that "Schumpeter's entrepreneur acts to *disturb* an existing equilibrium situation. Entrepreneurial activity disrupts the continuing circular flow. The entrepreneur is pictured as *initiating* change and as generating *new* opportunities. Although "each burst of entrepreneurial innovation leads eventually to a new equilibrium situation, the entrepreneur is presented as a disequilibrating rather than an equilibrating force" (Kirzner, 1973, p. 72). By contrast, says Kirzner, "my own treatment of the entrepreneur emphasizes the equilibrating aspect of his role" (*ibid*., p. 73). The adoption of this interpretation enables him to stress the voluntarism of the entrepreneur in the animation of the market process.

Indeed the analysis of Kirzner rests on a precise distinction between the concepts of market equilibrium of market process. When we reach the equilibrium all the agents' decisions are mutually compatible and perfectly coordinated because all of them have a complete information concerning the decisions of the other participants. However, for Kirzner, in such situation the activity of the entrepreneur does not have a *raison d'être*. On the contrary, when coordination is not complete, the entrepreneur plays an essential role. Thanks to his "alertness" to seize profits opportunities, the entrepreneur drives the process of market. His action contributes to support a better coordination of the agent's plans to allow the equilibrium of the market.

This concept of "alertness in action" enables to explain why, "far from being numbed by the inescapable uncertainty of our world, men *act upon their judgments of* what opportunities have been left unexploited by others" (Kirzner, 1973, p. 87). But the use of this concept of "alertness" to characterize the entrepreneur, leads Kirzner to "emphasize the capture of pure entrepreneurial profit as reducible essentially to the exploitation of arbitrage opportunities" (Kirzner, 1982, p. 141). Indeed, he thinks that there is a formal similarity between buying and selling on various markets today or at different dates.

Kirzner start from the notions of knowledge and discovery which are, according to him specific of the Austrian approach, to designs the concept of the arbitrage entrepreneur. Indeed, "this approach (a) sees equilibration as a systematic process in which market participants acquire more and more accurate and complete *mutual knowledge* of potential demand and supply attitudes, and (b) sees the driving force behind this systematic process in (…) *entrepreneurial discovery*" (Kirzner, 1997, p. 62). The characteristic of this approach is to use the idea of a "sheer ignorance" and not the hypothesis of imperfect information, because "sheer ignorance differs from imperfect information in that the discovery which reduces sheer ignorance is necessarily accompanied by the element of *surprise*" (*ibid*). However, this element of surprise could not be compared to a simple cost of the research or the production of missing information. Under these conditions, Kirzner can conceive the entrepreneurial discovery as a process which "gradually but systematically pushing back the boundaries of sheer ignorance, in this way increasing mutual awareness among market participants and thus, in turn, driving prices, output and input quantities and qualities, toward the values consistent with equilibrium" (*ibid*). The engine of this process is the permanent existence of profit opportunities which, while leading the market towards the equilibrium, prevents that this one is never reached. Indeed, "except in the never-attained state of complete equilibrium, each market is characterized by opportunities for pure entrepreneurial profit. These opportunities are created by earlier entrepreneurial errors which have resulted in shortages, surplus, misallocated resources" (*ibid*, p. 70). In this framework, the action of the entrepreneur favours the convergence of the market towards the equilibrium since "the daring, alert entrepreneur discovers these earlier errors, buys where prices are 'too low' and sells where prices are 'too high'" (*ibid*).

However, this behaviour of arbitrage does not allow that such process succeeds insofar the actions of correction of the entrepreneur open new opportunities which, once seized, can transform former actions into errors. The market process evolves continuously for two reasons. On the one hand, "that continual change in tastes, resource availabilities, and known technological possibilities always prevent this equilibrative process from proceeding anywhere near to completion", and on the other hand, "that entrepreneurial boldness and imagination can lead to pure entrepreneurial losses as well as to pure profit. Mistaken actions by entrepreneurs mean that they have misread the market, possibly pushing price and output constellations in directions not equilibrative" (*ibid*., p. 72).

Kirzner's emphasis on the entrepreneur's action joins L. von Mises who point out "in any real and living economy every actor is always an entrepreneur and a speculator" (Mises, 1949, Part 4, Ch. XIV). Under these conditions, it becomes difficult to define with precision the boundaries of entrepreneur's functions. Indeed, for him "every action is embedded in the flux of time and therefore involves speculation". As a result the function of the entrepreneur is totally diluted since "the capitalists, the landowners, and the labourers are by necessity speculators. So is the consumer in providing for anticipated needs" (*ibid*). Consequently, to recognize an entrepreneur among buyers and sellers is it necessary to gave him a specific psychological profile. This is the *raison d'être* of the concept of "natural alertness" which comes to justify that the contractor is not an economic agent like the others. However, this is not sufficient to differentiate Kirzner's entrepreneur from that of Mises.

More generally, the idea according to which the entrepreneur perceives before the others the profit opportunities generated by the existence of uncertainty, raises an important problem perfectly identified by G.B. Richardson (1960) about the theory of equilibrium. Even within the framework of perfect information, "the existence of such a general profit potential cannot automatically be assumed to create particular profit opportunities for individual entrepreneurs". Indeed, Richardson makes clear, "before any particular entrepreneur is prepared to invest in the production of commodity, he will have to be assured that the volume of supply planned by competing producers, who are also aware of the opportunity, will not be so large as to overstock the market, thus converting the expectation of profit into the realization of loss". But as Richardson points out, "how, in a perfect market, where all producers are free to move in response to the profit opportunity, is that assurance to be afforded him? And yet without this assurance, entrepreneurs would not invest, and supply would not be expanded; a general profit potential, which is known to all, and equally exploitable by all, is, for this reason, available to no one in particular" (Richardson, 1960, p.

14). This paradox, which is due to the fact that competition prevents the agents from communicating in-between them, can perfectly be extended to a situation of uncertainty. In this environment, the entrepreneur cannot know if the opportunity he perceives is found by others, but he also doesn't know if this opportunity of profit is mistaken. The paradox is reinforced since uncertainty, judicious to justify the role of the entrepreneur, impeach him to act.

Two solutions can be considered to overcome this difficulty. The first is developed by Richardson himself. He goes further through the idea that entrepreneurs devise their investments. By extension, the hypothesis makes it possible to solve the question of the boundaries of the firm (Richardson, 1972), but does not bring new elements about the statue of the entrepreneur in the firm. The second solution, which is not contradictory with the first, is developed by Edith T. Penrose in *The theory of the Growth of the Firm* (1959). This work enables to explain not only the institutional dimension of the firm but also the behaviour of the entrepreneur.

THE ENTREPRENEURIAL FIRM AS A SOLUTION TO THE PARADOXE OF THE ENTREPRENEUR

Penrose's analysis of the growth of the firm is better known than the one of the entrepreneur. However, as we will see, the first cannot be conceived without the second. Indeed, she points out that the firm is "the basic unit for the organization of production" and because it has this particular function it is "a complex institution, impinging on economic and social life in many direction, comprising numerous and diverse activities, making a large variety of significant decisions, influenced by miscellaneous and unpredictable human whims" (Penrose, 1959, p. 9). By tackling the question of the firm from the production and not of the exchange, Penrose distinguishes from Coase (Ravix, 1999) and shows that this one has a double dimension: on the one hand, it is an institution which has the function to carry out the production. On the other hand, as this function implies to make decisions, the firm also has a behavioural dimension which concerns the action of the entrepreneur. This is this double dimension which makes it possible to define the concept of the entrepreneurial firm, defined in Penrose's analyses.

The institutional dimension is important to justify the specificity of the firm compared to the market: "the essential difference between economic activity inside the firm and economic activity in the 'market' is that the former is carried on within an administrative organization, while the latter is not" (*ibid.*, p. 15). However, Penrose goes beyond the concept of direction, characteristic of the administrative organization. If this dimension allows establishing a distinction between organization and market, it is not specific to the firm since other forms of socio-economic organizations do the same. That is why Penrose insists on the fact that "a firm is more than an administrative unit; it is a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision" (*ibid*, p. 24).

Penrose emphases the problem of the organization of the production and establishes an additional distinction between the productive resources and the services rendered by these resources. Thus, "strictly speaking, it is never *resources* themselves that are the 'input' in the production process, but only the *services* that the resources can render" (*ibid.*, p. 25). For Penrose, "the important distinction between resources and services is not their relative durability; rather it lies in the fact that resources consist of a bundle of potential services and can, for the most part, be defined independently of their use, while services cannot be so defined, the very word 'service' implying a function, an activity" (*ibid.*).

Penrose starts from this distinction to dismiss the concept of production factor and replace it with "productive opportunity". This concept does not indicate the whole of the average materials available in firm at a given time, but corresponds to the second dimension of the firm distinguished by Penrose. Indeed, the productive opportunity of the firm, by gathering "all of the productive possibilities that its 'entrepreneurs' see and can take advantage of" (*ibid*, p. 31), makes it possible to characterize the behavioural dimension of the firm, its action of undertaking, which completes its institutional dimension. Penrose links this second dimension with the concept of entrepreneurship which, even if it is a "slippery" concept, is closely associated with "the temperament or personal qualities of individuals" (*ibid*, p. 33), remains nevertheless an essential element to understand the process of the growth of the firms. The concept of "productive opportunity" can be treated also as "a psychological predisposition on the part of individuals to take a chance in the hope of gain, and, in particular, to commit effort and resources to speculative activity" (*ibid*, p. 33). However, this psychological predisposition has nothing to do with the quality of the anticipations or of the calculations of the entrepreneur. It simply corresponds to "the decision to make some calculations" (*ibid.*).

Penrose considers that "the 'expectations' of a firm – the way in which it interprets its 'environment' – are as much a function of the internal resources and operations of the firm as of the personal qualities of the entrepreneur" (*ibid.*, p. 41). This report enables her to establish, within her concept of "productive opportunity", a distinction between the potential "objective" productive opportunity of the firm, expressing what the firm is able to do or its competences, and its "subjective" productive opportunity, corresponding to what the firm "thinks it can accomplish" (*ibid.*). If the objective productive opportunity is linked to the internal resources and the activity of the firm, the subjective productive opportunity indicates how the firm interprets its environment.

However, Penrose highlights that "'expectations' and not 'objective facts' are the immediate determinants of a firm's behaviour" (*ibid.*, p. 41). This idea is an extend of K. Boulding work's (1956), according to which there are not objective facts but only "images" subjectively created from the interpretation of information coming from the environment. "In other words, rather than beginning with the objective environment of the firm, and the information that this environment generates – in the form, for example, of market prices, market demands, the activities of competitors, etc. – Penrose starts with the mental world of the planners who are situated within the context of their own firm and its specific productive services" (Fransman, 1994, p. 743). Indeed, the only objective phenomena are irreversible past events that the firm cannot handle anymore, while the firm's expectations rest on possibilities not realized yet. As a results, "firms not only alter the environmental conditions necessary for the success of their actions, but, even more important, they know that they can alter them and that the environment is not independent of their own activities" (Penrose, 1959, p. 42).

With this framework Penrose avoids the problem rose by Richardson and provides a satisfactory explanation of the entrepreneurial behaviour. Indeed, in her approach uncertainty does not block the entrepreneur's action. This one is not a simple arbiter who speculates while adapting to the markets opportunities. He is a real entrepreneur who tries to transform his environment to take advantage from it. This analysis is based on a concept of risk and uncertainty different from that of Knight. As the environment of the entrepreneur could not be an objective data, it results from it that "'uncertainty' refers to the entrepreneur's confidence in his estimates or expectations; 'risk', on the other hand, refers to the possible outcomes of action, specifically to the loss that might be incurred if a given action is taken" (*ibid*, p.56). This opposition rises from the idea that the decision-making is not related to the various possibilities which could be realized, but to the way the entrepreneur interprets these possibilities. Thus the risk is not linked to the probability of realization of a random event, but to the material capacities of the firm to assume it. Under these conditions, the possibilities of action of the entrepreneur are not directly related to the risks inherent to his environment, but depend on his resources and on his competences. Then we are able to understand why the action of the entrepreneur necessarily takes place in the firm. Indeed, as Langlois points out "the firm exists because of entrepreneurship" (2005, p. 1). As a consequence, entrepreneur action implies the creation and the development of a company.

Since one admits Penrose's idea that "the essentially subjective nature of demand from the point of view of the firm" (*ibid.*, p. 80), it becomes possible to consider that the entrepreneur does not take "demand as 'given', but rather as something he ought to be able to do something about" (*ibid.*). In other words, the market is not external to the firm, but a normal extend of its activity. It is similar to the commercial deals set up by the firm since "the 'demand' with which an entrepreneur is concerned when he makes his production plans is nothing more nor less than his own ideas about what he can sell at various prices with varying degrees of selling effort" (*ibid.*, p. 81). More precisely, for Penrose to answer to this demand which she perceives in a subjective way, the entrepreneur built "areas of specialization" which represent both the internal and external organization of the firm. This concept of areas of specialization includes two different but narrowly complementary elements: On the one hand, the "production base", that gathers the whole of the means and the technical skills mobilized by the company to produce. In the other hand, the "market area", corresponds to "each group of customers which the firm hopes to influence by the same sales programme" (*ibid.*, p. 110). The concept of areas of specialization comes to complete that of productive opportunity. These two concepts are thus respectively only the concretization of the institutional dimension and the behavioural dimension of the firm.

CONCLUSION

The abandonment of the Marshallian perspective, as well by the neo-institutional approach as by the Austrian approach, leads to the eviction or the dilution of the role of the entrepreneur. This result is very paradoxical concerning the Austrian approach as its ambition is to put the action of the entrepreneur in the core of the market process. A similar attempt can be found in Knight's work, but it could not be confused with the Austrian one. Indeed, these authors do not only justify the economic role of the entrepreneur by his psychological profile, they give him the mission to guarantee a fixed income to the economic agents who don't like to take risks. However this function misses in the analyses of Mises and Kirzner because the first, while adhering to the catalectic, considers economic activity as the only activity of exchange and the second focuses only on the market process. As a consequence, both pay no attention to specificity of the productive dimension, what Knight does. However this function is not very helpful to justify the role of the entrepreneur since it appears as the result and not as the cause of his action. Indeed, because the entrepreneur sets up the production, he's led to pay a fixed income to employees and to capitalists and not the reverse. Interpreted like this the criticism of Coase with regard to Knight is relevant: the fact to pay incomes to certain categories of agents is not sufficient to specify the function of the entrepreneur.

Coase puts aside the problem of the function of the entrepreneur to rise the one of the nature of the firm. Thus he manages to define the simplest institutional divisions of the activity of coordination: between the firm and the market. Although, this dichotomic division occurs in an uncertain environment, it remains static and does not permit to treat the question of action of the entrepreneur. On the contrary, Penrose emphases the productive function of the firms, as a result she manages to explain that those act because "the environment is not something 'out there', fixed and immutable, but can itself be manipulated by the firm to serve its own purposes" (Penrose, 1995, p. XIII). With this very specific approach of the environment, Penrose can show that the possibilities of action of the firm are closely related to its internal and external organization, *i.e.* to its productive opportunities and its areas of specialization which are, each other, the result of its accumulated experience. That the reason why she claims that "one of the primary assumptions of the theory of the growth of the firm is that 'history matters" (ibid). This accumulated experience, which comes from the past activities of the firms, appears in the "changes in knowledge acquired and changes in the ability to use knowledge". Indeed, to change its area of specialization, each firm has to acquire new knowledge and to create new competences and "change in knowledge acquired and changes in the ability to use knowledge" (Penrose, 1959, p. 52-53). To modify its area of specialisation each firm has to acquire new knowledge to create new competences and « this increase in knowledge not only causes the productive opportunity of a firm to change in ways unrelated to changes in the environment, but also contributes to the 'uniqueness' of the opportunity of each individual firm » (*ibid*., p. 52-53). This process, by explaining how knowledge acts on the production and how the organization helps knowledge, could be an analytical base to understand the institutional organization of the production in the extent of Marshall's work.

As a conclusion, the firm is not a static element of the economic system. Its evolution leads to a perpetual change in the internal and external organization of the production. But the firm doesn't behave by itself, it is the entrepreneur who drives this machine. He is at the origin of each decision because he is the only one which can interpret and determine how to act on the environment. As a consequence he is the driving belt which transmits the change to the industry and to the whole economic system.

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